

The background of the slide is a collage of four images: top-left shows a soldier in a full-body protective suit; top-right shows a diver in full scuba gear underwater; bottom-left shows a military amphibious vehicle with soldiers on board; bottom-right shows a bulldozer working on a rocky terrain.

SECNAV Energy Training NECC/NECCPAC Overview

**6 November
2014**





Agenda



- **NECC overview**
- **Expeditionary Energy drivers**
- **Consumption reduction status and projections**
- **NECC Energy Strategy**
- **Potential Materiel Solutions**
- **Non-Materiel Solutions**



Navy Expeditionary Combat Command



Coastal Riverine



Explosive Ordnance



Naval Construction

Navy Expeditionary Combat Command Mission:

Organize, man, train, equip, and sustain NECC forces to execute combat, combat support and combat service support missions across the spectrum of joint, combined, and multinational operations in green and brown water environments to include confronting irregular challenges in the near-coast, inshore, and riparian environments to include irregular warfare and other shaping missions that secure strategic access from the sea and global freedom of action.



Expeditionary Intelligence



Combat Camera



Expeditionary Logistics



Expeditionary Combat Readiness



NECC OV-1 Phase 1-5 Operations





Why Expeditionary Energy?

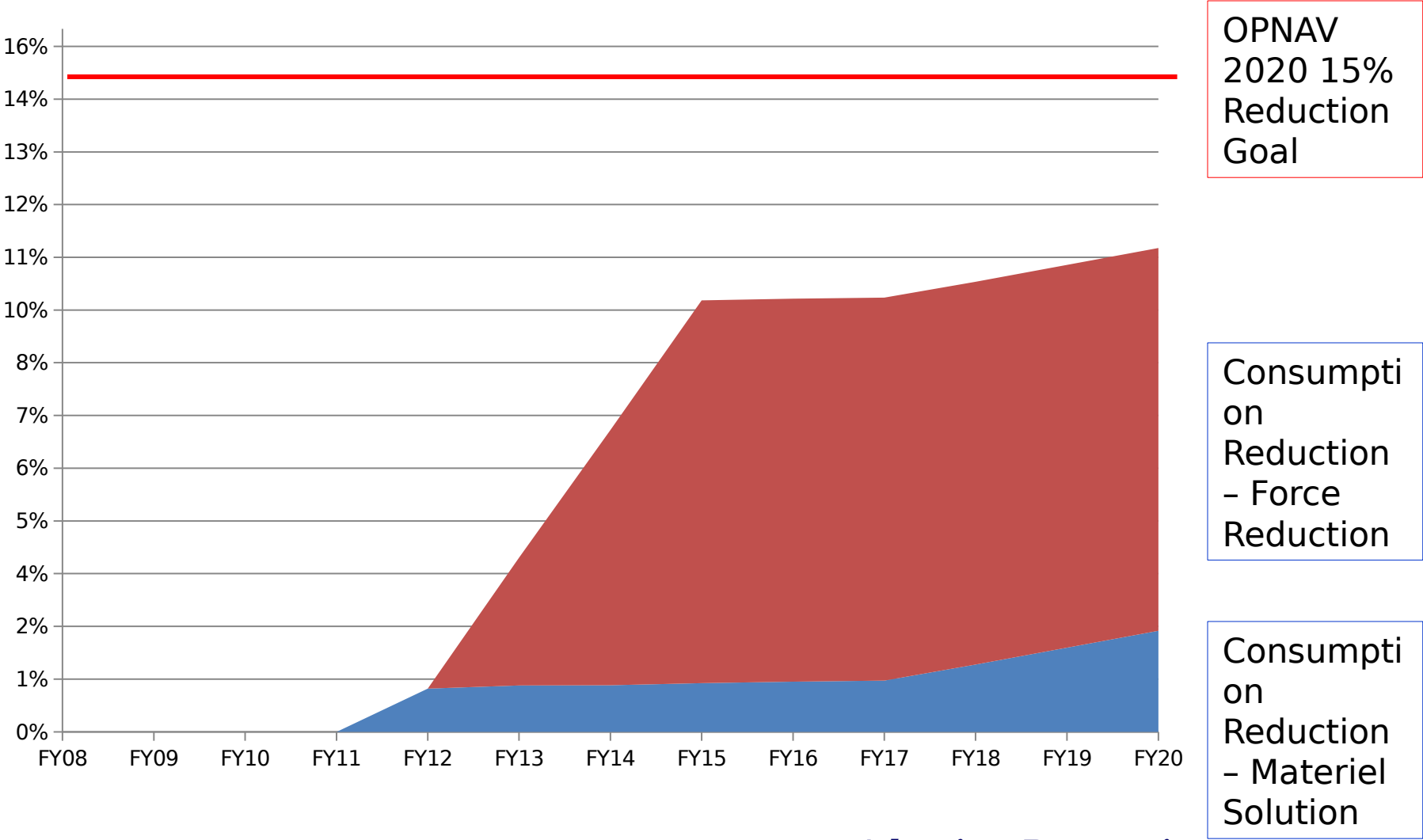
Cost of Fuel

- TRANSCOM estimated that ground convoys in Afghanistan suffered more than **1,100 attacks** in 2010 (including IEDs)
- **1 Marine casualty** for every **50** fuel/water convoys (2010 Afghanistan)
- USMC - **10% of battlefield casualties** in Iraq and Afghanistan are related to convoy operations
- Between 2003 - 2007, **3000 US troop and contractor deaths or injuries** were attributed to fuel supply convoys in Iraq and Afghanistan
- As much as **1.4 gallons of fuel can be consumed to deliver 1 gallon of fuel** to forces on the battlefield





Consumption Reduction Projections





NECC Energy Strategy



“Roadmap to deliver NECC operational capability with less reliance on high cost or inefficient energy sources.”

- Use of alternative energy sources in expeditionary operations
- Pursuit of equipment efficiency
- Reduction of fuel consumption through changing equipment usage in expeditionary operations

Short range strategy: 2011 - 2015

- Focus on efficiency through modern energy efficient equipment via normal equipment Phase Replacement/Technical Refresh (PR/TR)
- Focus on training and education throughout the force

Mid range strategy: 2016 - 2020

- Focus on Top Fuel consumers
- Encourage and explore development of advanced technologies focused on higher levels of energy efficiency through RDT&E and Acquisition processes

Long range strategy: 2021 - 2025

- Continued focus on Top Fuel consumers



NECC Energy Strategy Concepts and Precepts



- **Cost effectiveness and commonality of parts, equipment, systems and procedures with USMC and Joint Forces as applicable**
- **SYSCOMs partnering with other services, joint commands, and DoD agencies in support of equipment refresh and modernization efforts**
- **Leveraging and capitalizing on other DoD and commercial initiatives**
 - Lead/follow strategy
 - COTS/GOTS validation and adaptation for NECC use
- **Pursue non-materiel solutions and applications as well as materiel solutions**



NECC Top Fuel Consumers



- **Watercraft**
- **Medium sized tactical vehicles - Medium Tactical Vehicle Replacement family**
- **Construction equipment**
- **Generator group**
- **Environmental Control Unit (ECU) group**



Top Five accounts for over 90% of all fuel consumed throughout NECC



Combatant Craft Energy Initiatives

- **Full power demonstration successfully conducted on Riverine Command Boat using 50% algae-based biofuel blend diesel**
- **Data Acquisition Systems installed on boats for metering and monitoring automated fuel consumption and engine performance**

Help establish most efficient operational parameters for engine & propulsion systems

- Inform/influence training and operations to minimize speed extremes when applicable (fast/slow idling, accelerations, crash stops, etc.)
- Assist in determining optimal maneuvering parameters (wave approach, transitions from brown/green/blue water, etc.)
- Determining most efficient use of power take offs and ancillary systems (i.e. - A/C)
- Facilitate preventative and predictive maintenance



- **Exploring feasibility of electric outboards (200+ Hp) for boats and missions that are compatible with such technology**

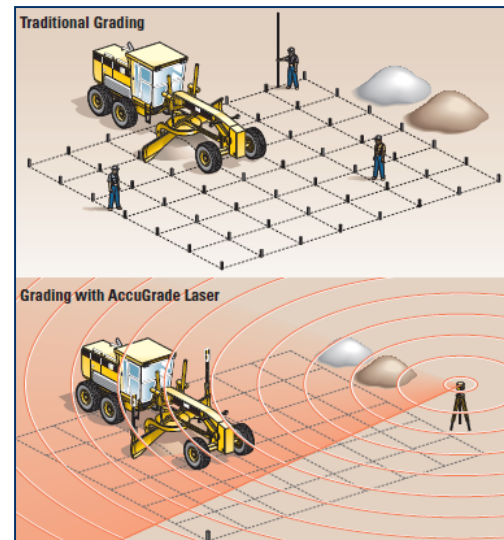
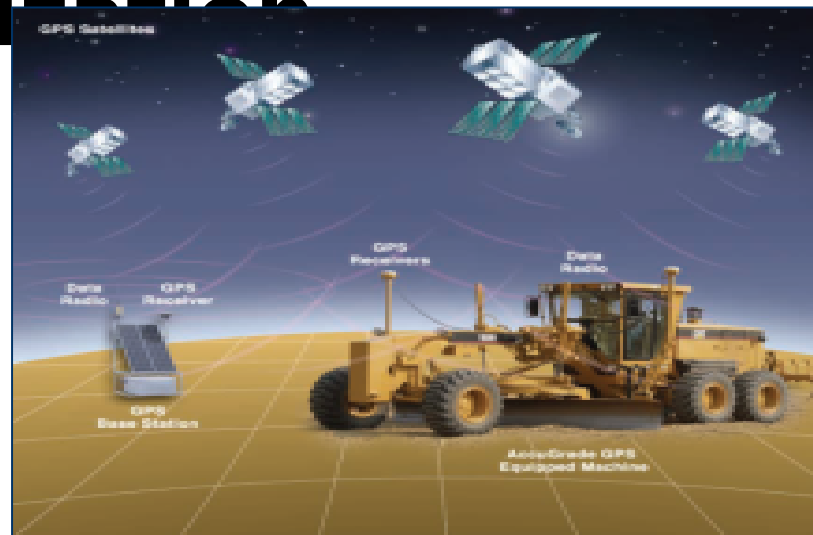
- EOD ESW & MDSU operations
- HVA Escort missions in the Panama Canal
- Harbor Security missions



Initiatives

GPS Blade Control

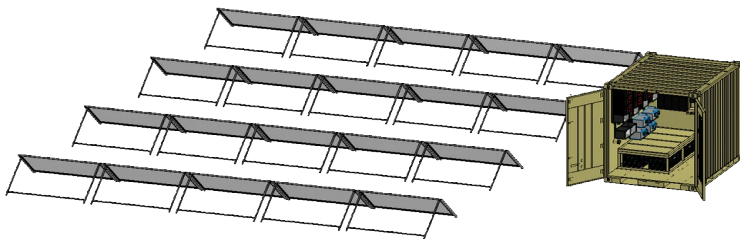
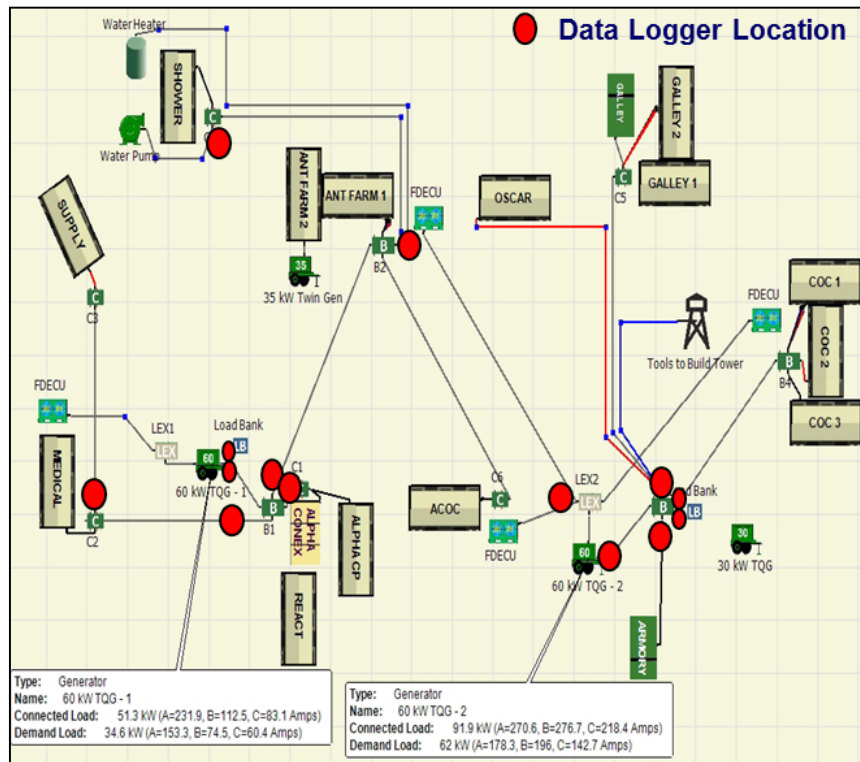
- Improves earth-moving operational efficiency - manpower and fuel consumption efficiencies
- During testing GPS-assisted dozer reduced total time by as much as 50%, translating to 40% reduction in fuel consumption
- Will provide reduction in fuel cost, manpower and potential risk in non-permissive environments



- Initial procurements of the blade control systems have



Expeditionary Power Integration and Control (EPIC)



- **SMART Grid technology**
 - Generator output changes with load changes - maximizing generator efficiency
 - Real time communication between load (ECU) and generator source
 - As demand decreases power generation decreases along with fuel consumption
- **Micro Grid technology**
 - Camp supported by primary grid with power supplied by main generators
 - CoC supported by a smaller grid with solar and generator for



Expeditionary Facilities

- **Total camp design for functionality while minimizing fuel consumption demands and burdens**
- **Tracking market and assessments of technology developments for selective applications in**
 - Thermally efficient tents/structures
 - Insulated tent liners to be added to all NECC TOAs
 - Radiant heat shielding
- **Develop energy kits to include**
 - LED lighting, motion sensors, and tent liners
- **Monitoring and supporting Army & USMC Force Provider efforts to assess alternative energy equipment applications to forward operating bases (FOBs)**



TEMPER TY XXXI Air Supported Tent - Extreme Weather Insulated Liner - 3M™ Thinsulate insulation with FR Rip stop nylon shell



LED Light



Fitted ULCANS Shade System



Adaptive, Responsive, Expeditionary **13**



Environmental Control Units (ECU)



- **Improved ECU (IECU)**

- 20% more efficient than current ECUs in TOA
- RDT&E underway to reduce power demand another 50%



- **Mobile platform containing an integrated Generator and ECU for near term deployment**

- 20% more efficient than current ECU





Non-Materiel Solutions

Where/How Systems are Used

- **Erection of tents and manner in which ECU ducting is connected**
 - Ensure solid barrier and intake/exhaust placements are precise
- **Placement of generators in camps to minimize driving routes for fuel truck**
- **Boats idling on station for extended periods of time**
- **Convoy idling while waiting for step off**
- **Unnecessary acceleration in vehicles & water craft - operator behavior**
- **Alternate vehicle power profiles**
 - Reprogram Engine Control Unit with fuel efficient power profile - potential 11.8% decrease in fuel consumption)

How the Systems are Maintained

- **Ensuring equipment is clean and in good working order**
 - Minimizes mechanical inefficiencies (ECU ducting, ECU internals, use covers, cabling, PDPs, etc.)

It all adds up and every little bit helps!



Conclusion

- **Good progress to date but much more to be done!**
- **Appropriate focus on material and non-material solutions**
- **Continue to leverage Joint solutions and COTS/GOTS applications**
- **Maintain big picture and keep the long view - enhanced operational capability and mission/materiel readiness are the drivers for what we're doing**
- **Educate, educate, educate - from the top to the deck plates!**
- **Communications are paramount - input and**



Questions?

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Back-up

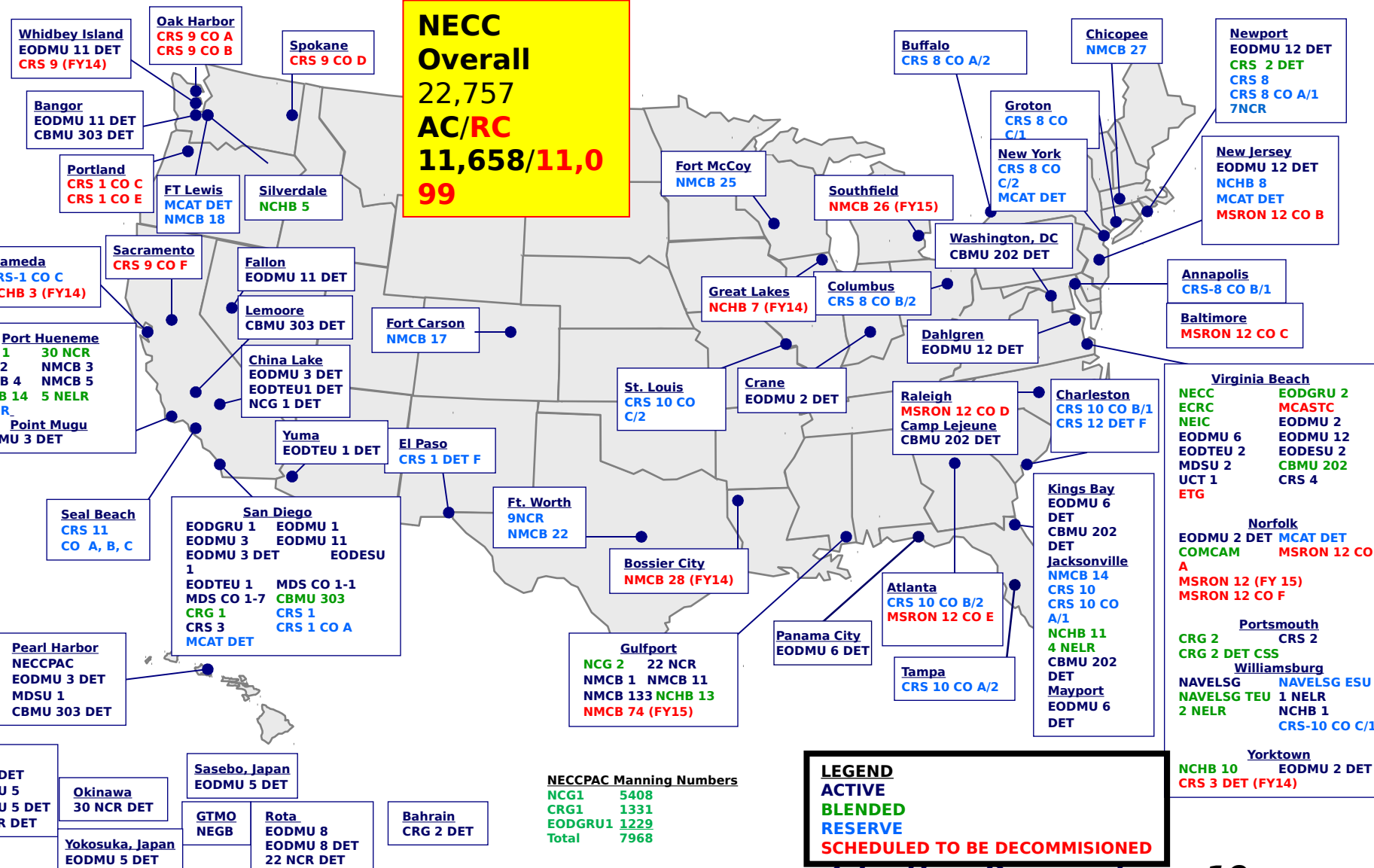


NECC/NECCPAC Unit Locations

NECC Overall
22,757
AC/RC
11,658/11,099

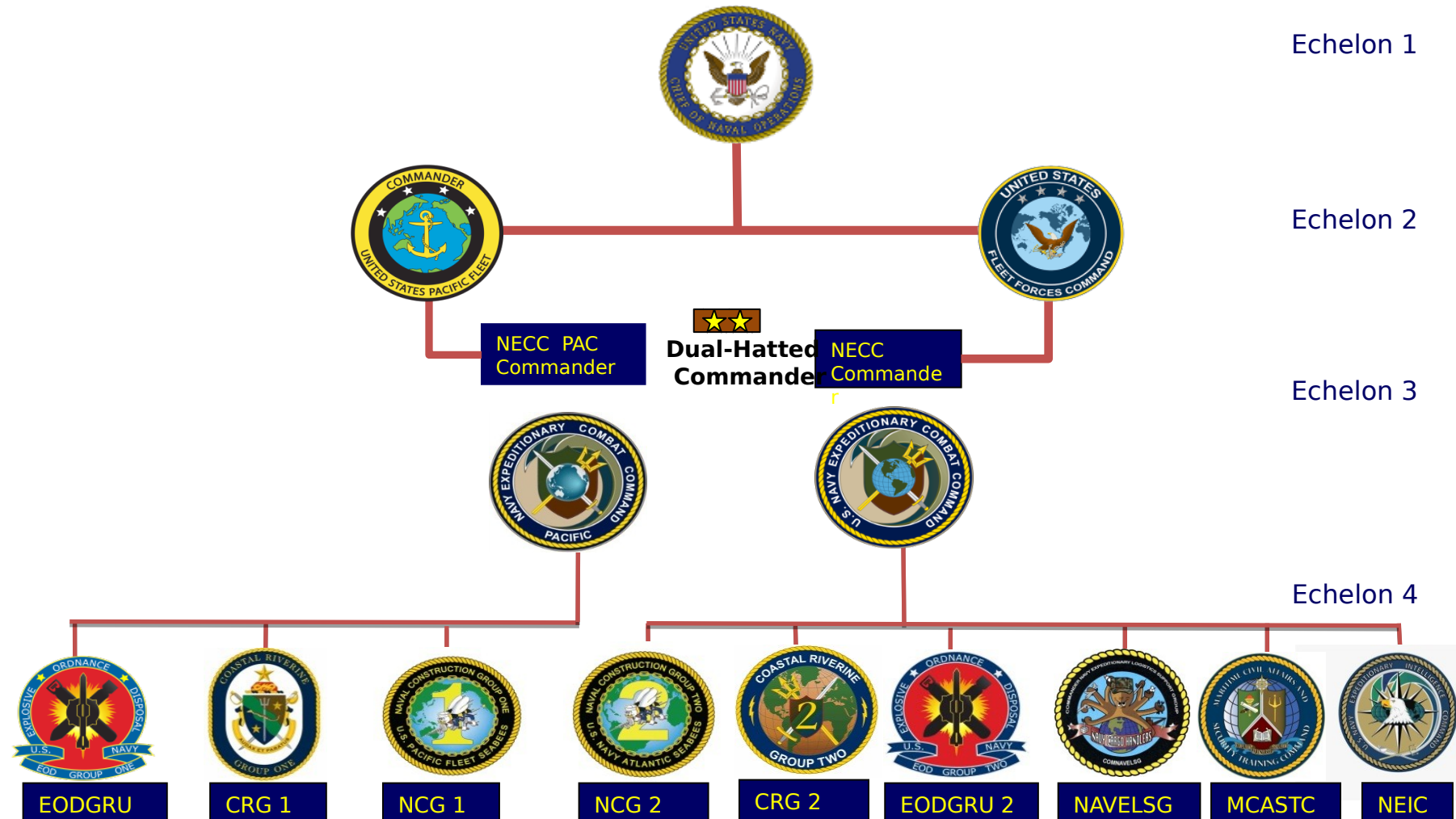
NECCPAC Manning Numbers
NCG1 5408
CRG1 1331
EODGRU1 1229
Total 7968

LEGEND
ACTIVE
BLENDED
RESERVE
SCHEDULED TO BE DECOMMISSIONED





NECC Organization





NECC at a Glance

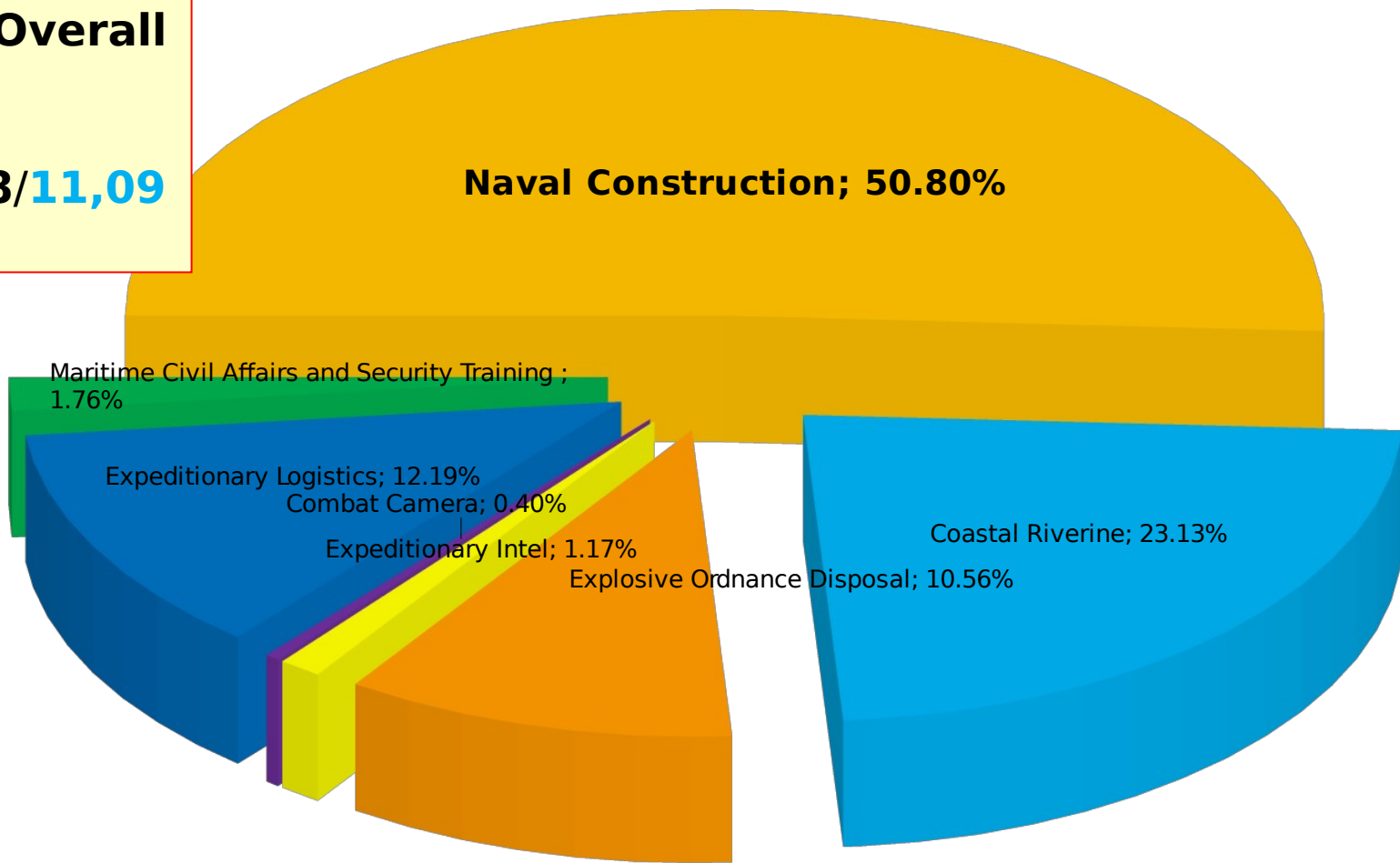
NECC Overall

22,757

AC/RC

11,658/11,099

9



Unique Warfighting Capabilities; 49 percent Reserve Sailors



NECE Initiatives for CY2014



Initiative 3.4: Tactical Energy Security: Continued implementation of the NECC 15 year strategy to meet the Navy's goals to reduce energy.

Lead Org: NECC | Lead Name: John Mark Serré

Secondary Org: NAVFAC | Secondary Lead: LCDR Michael James

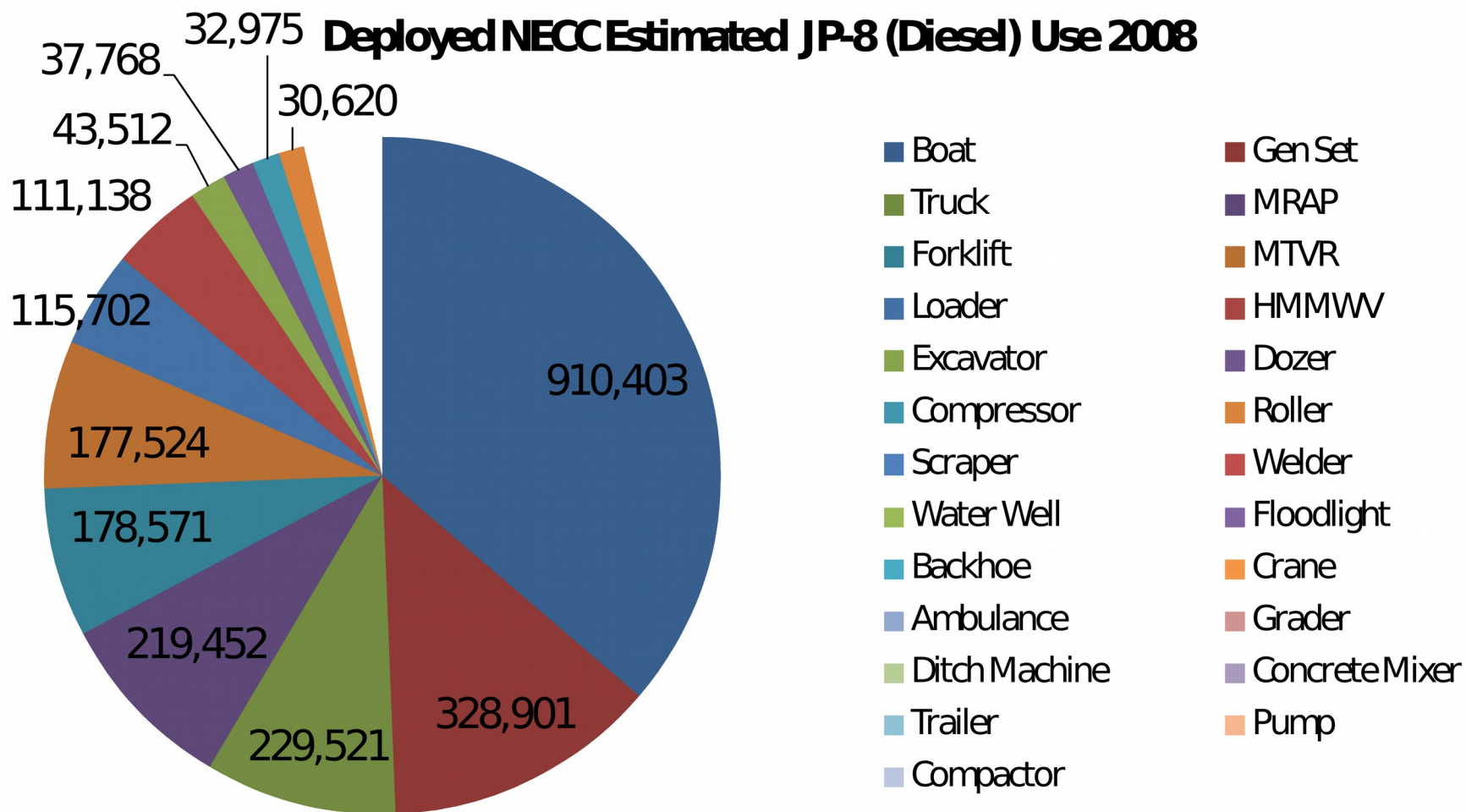
Action ID	Action	Supporting Org	Est Start Date	Est Comp Date	Status	Reason
3.4.01	Develop expeditionary energy training to enhance materiel/non materiel solution awareness in support of SECNAV/OPNAV energy goals.		1/4/2014	12/1/2014	On Track	On Track
3.4.02	Analyze opportunities to implement behavioral, operational and procedural (non-materiel solutions) changes to meet NECC's long term energy goals. Develop areas of opportunity for subsequent development. ID and implement TTP and CONOPS changes to meet NECC's long term energy goals.		1/1/2014	12/31/2014	On Track	On Track



2008 Fuel Consumption Baseline (Gallons)



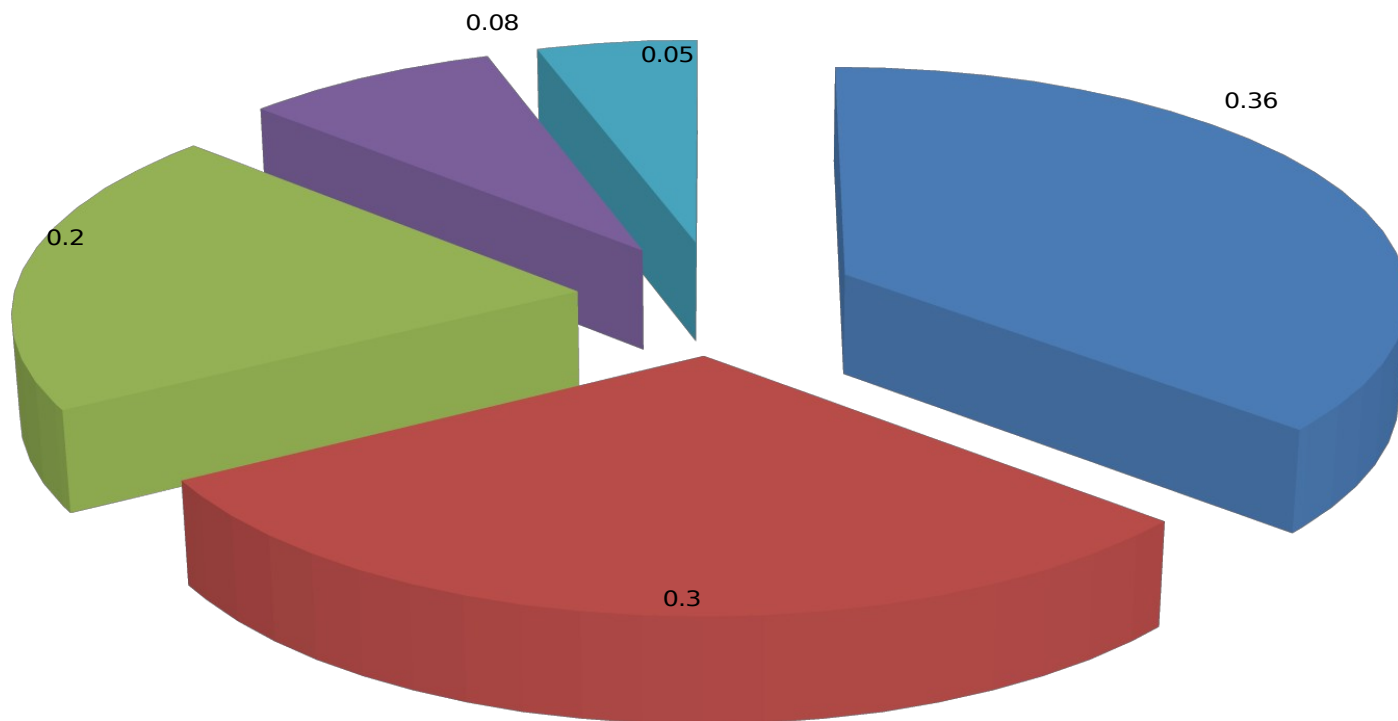
Deployed NECC Estimated JP-8 (Diesel) Use 2008



2,509,740 Gallons Total



NECC Top Fuel Consumer Categories



Top Consumers Account for 99% of Fuel Use